CLAIMS

What is claimed is:

1. A method for identifying a test compound as a candidate for an antibiotic, comprising:

a) contacting a histidinol-phosphatase polypeptide with a test compound; and

b) detecting the presence or absence of binding between said test compound and said histidinol-phosphatase polypeptide,

wherein binding indicates that said test compound is a candidate for an antibiotic.

2. The method of claim 1, wherein said histidinol-phosphatase polypeptide is a fungal histidinol-phosphatase polypeptide.

3. The method of claim 1, wherein said histidinol-phosphatase polypeptide is a *Magnaporthe* histidinol-phosphatase polypeptide.

4. The method of claim 1, wherein said histidinol-phosphatase polypeptide is SEQ ID NO: 3.

5. A method for determining whether the antibiotic candidate of claim 1 has antifungal activity, further comprising:

contacting a fungus or fungal cells with said antibiotic candidate and detecting the decrease in growth, viability, or pathogenicity of said fungus or fungal cells.

6. A method for identifying a test compound as a candidate for an antibiotic, comprising:

a) contacting a test compound with at least one polypeptide selected from the group consisting of: a polypeptide having at least ten consecutive amino acids of a fungal histidinol-phosphatase; a polypeptide having at least 50% sequence identity with; and a polypeptide having at least 10% of the activity of a fungal histidinol-phosphatase; and

b) detecting the presence and/or absence of binding between said test compound and said polypeptide,

wherein binding indicates that said test compound is a candidate for an antibiotic.

7. A method for determining whether the antibiotic candidate of claim 6 has antifungal activity, further comprising:

contacting a fungus or fungal cells with said antibiotic candidate and detecting a decrease in growth, viability, or pathogenicity of said fungus or fungal cells.

8. A method for identifying a test compound as a candidate for an antibiotic, comprising:

a) contacting L-histidinol phosphate and H_2O with a histidinol-phosphatase;

b) contacting L-histidinol phosphate and H_2O with histidinol-phosphatase and a test compound; and

c) determining the change in concentration for at least one of the following: L-histidinol phosphate, H_2O, L-histidinol, and/or orthophosphate,

wherein a change in concentration for any of the above substances between steps (a) and (b) indicates that said test compound is a candidate for an antibiotic.

9. The method of claim 8, wherein said histidinol-phosphatase is a fungal histidinol-phosphatase.

10. The method of claim 8, wherein said histidinol-phosphatase is a *Magnaporthe* histidinol-phosphatase.

11. The method of claim 8, wherein said histidinol-phosphatase is SEQ ID NO: 3.

12. A method for determining whether the antibiotic candidate of claim 8 has antifungal activity, further comprising:

contacting a fungus or fungal cells with said antibiotic candidate and detecting a decrease in growth, viability, or pathogenicity of said fungus or fungal cells.

13. A method for identifying a test compound as a candidate for an antibiotic, comprising:

a) contacting L-histidinol and orthophosphate with a histidinol-phosphatase;

b) contacting L-histidinol and orthophosphate with a histidinol-phosphatase and a test compound; and

c) determining the change in concentration for at least one of the following: L-histidinol phosphate, H_2O, L-histidinol, and/or orthophosphate,

wherein a change in concentration for any of the above substances between steps (a) and (b) indicates that said test compound is a candidate for an antibiotic.

14. The method of claim 13, wherein said histidinol-phosphatase is a fungal histidinol-phosphatase.

15. The method of claim 13, wherein said histidinol-phosphatase is a *Magnaporthe* histidinol-phosphatase.

16. The method of claim 13, wherein said histidinol-phosphatase is SEQ ID NO: 3.

17. A method for determining whether the antibiotic candidate of claim 13 has antifungal activity, further comprising:

contacting a fungus or fungal cells with said antibiotic candidate and detecting a decrease in growth, viability, or pathogenicity of said fungus or fungal cells.

18. A method for identifying a test compound as a candidate for an antibiotic, comprising:

a) contacting L-histidinol phosphate and H_2O with a polypeptide selected from the group consisting of: a polypeptide having at least 50% sequence identity with histidinol-phosphatase; a polypeptide having at least 50% sequence identity with a histidinol-phosphatase and having at least 10% of the activity thereof; and a polypeptide comprising at least 100 consecutive amino acids of a histidinol-phosphatase;

b) contacting L-histidinol phosphate and H_2O with said polypeptide and a test compound; and

c) determining the change in concentration for at least one of the following: L-histidinol phosphate, H_2O, L-histidinol, and/or orthophosphate,

wherein a change in concentration for any of the above substances between steps (a) and (b) indicates that said test compound is a candidate for an antibiotic.

19. A method for identifying a test compound as a candidate for an antibiotic, comprising:

a) contacting L-histidinol and orthophosphate with a polypeptide selected from the group consisting of: a polypeptide having at least 50% sequence identity with a histidinol-phosphatase; a polypeptide having at least 50% sequence identity with a histidinol-phosphatase and at least 10% of the activity thereof; and a polypeptide comprising at least 100 consecutive amino acids of a histidinol-phosphatase;

b) contacting L-histidinol and orthophosphate, with said polypeptide and a test compound; and

c) determining the change in concentration for at least one of the following: L-histidinol phosphate, H_2O, L-histidinol, and/or orthophosphate,

wherein a change in concentration for any of the above substances between steps (a) and (b) indicates that said test compound is a candidate for an antibiotic.

20. A method for identifying a test compound as a candidate for an antibiotic, comprising:

a) measuring the expression of a histidinol-phosphatase in a cell, cells, tissue, or an organism in the absence of a test compound;

b) contacting said cell, cells, tissue, or organism with said test compound and measuring the expression of said histidinol-phosphatase in said cell, cells, tissue, or organism; and

c) comparing the expression of histidinol-phosphatase in steps (a) and (b),

wherein a lower expression in the presence of said test compound indicates that said test compound is a candidate for an antibiotic.

21. The method of claim 20 wherein said cell, cells, tissue, or organism is, or is derived from a fungus.

22. The method of claim 20 wherein said cell, cells, tissue, or organism is, or is derived from a *Magnaporthe* fungus or fungal cell.

23. The method of claim 20, wherein said histidinol-phosphatase is SEQ ID NO: 3.

24. The method of claim 20, wherein the expression of histidinol-phosphatase is measured by detecting HISP1 mRNA.

25. The method of claim 20, wherein the expression of histidinol-phosphatase is measured by detecting histidinol-phosphatase polypeptide.

26. A method for identifying a test compound as a candidate for an antibiotic, comprising:

a) providing cells having one form of a histidinol-phosphatase gene, and providing comparison cells having a different form of a histidinol-phosphatase gene; and

b) contacting said cells and said comparison cells with a test compound and determining the growth of said cells and comparison cells in the presence of the test compound,

wherein a difference in growth between said cells and said comparison cells in the presence of said compound indicates that said compound is a candidate for an antibiotic.

27. The method of claim 26 wherein the cells and the comparison cells are fungal cells.

28. The method of claim 26 wherein the cells and the comparison cells are *Magnaporthe* cells.

29. The method of claim 26 wherein said form and said comparison form of the histidinol-phosphatase are fungal histidinol-phosphatases.

30. The method of claim 26, wherein at least one of the forms is a *Magnaporthe* histidinol-phosphatase.

31. The method of claim 26 wherein said form and said comparison form of the histidinol-phosphatase are non-fungal histidinol-phosphatases.

32. The method of claim 26 wherein one form of the histidinol-phosphatase is a fungal histidinol-phosphatase, and the other form is a non-fungal histidinol-phosphatase.

33. A method for identifying a test compound as a candidate for an antibiotic, comprising:

a) providing cells having one form of a gene in the L-histidine biochemical and/or genetic pathway and providing comparison cells having a different form of said gene.

b) contacting said cells and said comparison cells with a test compound,

c) determining the growth of said cells and said comparison cells in the presence of said test compound,

wherein a difference in growth between said cells and said comparison cells in the presence of said test compound indicates that said test compound is a candidate for an antibiotic.

34. The method of claim 33 wherein the cells and the comparison cells are fungal cells.

35. The method of claim 33 wherein the cells and the comparison cells are *Magnaporthe* cells.

36. The method of claim 33 wherein said form and said different form of the L-histidine biosynthesis gene are fungal L-histidine biosynthesis genes.

37. The method of claim 33, wherein at least one form is a *Magnaporthe* L-histidine biosynthesis gene.

38. The method of claim 33 wherein said form and said different form of the L-histidine biosynthesis genes are non-fungal L-histidine biosynthesis genes.

39. The method of claim 33 wherein one form of the L-histidine biosynthesis gene is a fungal L-histidine biosynthesis gene, and the different form is a non-fungal L-histidine biosynthesis gene.

40. A method for determining whether the antibiotic candidate of claim 33 has antifungal activity, further comprising:

contacting a fungus or fungal cells with said antibiotic candidate and detecting a decrease in growth, viability, or pathogenicity of said fungus or fungal cells, wherein a decrease in growth, viability, or pathogenicity of said fungus or fungal cells indicates that the antibiotic candidate has antifungal activity.

41. A method for identifying a test compound as a candidate for an antibiotic, comprising:

(a) providing paired growth media; comprising a first medium and a second medium, wherein said second medium contains a higher level of L-histidine than said first medium;

(b) contacting an organism with a test compound;

(c) inoculating said first and said second media with said organism; and

(d) determining the growth of said organism,

wherein a difference in growth of the organism between said first and said second media indicates that said test compound is a candidate for an antibiotic.

42. The method of claim 41, wherein said organism is a fungus.

43. The method of claim 41, wherein said organism is *Magnaporthe.*

44. An isolated nucleic acid comprising a nucleotide sequence that encodes a polypeptide of SEQ ID NO: 3.

45. The nucleic acid of claim 44 comprising the nucleotide sequence of SEQ ID NO: 1.

46. An expression cassette comprising the nucleic acid of claim 45.

47. The isolated nucleic acid of claim 44 comprising a nucleotide sequence with at least 50 to at least 95% sequence identity to SEQ ID NO: 1.

48. A polypeptide consisting essentially of the amino acid sequence of SEQ ID NO: 3.

49. A polypeptide comprising the amino acid sequence of SEQ ID NO: 3.